

Title: Managing Mugwort In Field Nurseries With Cultivation And Herbicides

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Abstract:

A field study was established in 2012 to evaluate the effect that vigorous cultivation (rototilling) may have on improving the efficacy of currently registered herbicides. The target weed, mugwort (*Artemisia vulgaris*), has deep rhizomes that often allow it to escape complete control with available herbicides. If a late summer rototilling can reduce the size of the rhizomes and bring them closer to the surface, then fall-applied herbicides should be more effective in preventing the smaller rhizomes from regenerating shoots the following spring. The study was planned for two geographically separate nurseries with a similar weed problem. The site at Schichtel's Nursery in Springville, NY was successfully established in early October 2012. The results of those treatments are reported below. The second site was established at Warren's Nursery, Water Mill, Long Island, NY. However, at the time of treatment in late October 2012, the nursery owner had a business-related emergency and was not able to offer the plot area for this study.

Background and justification:

Mugwort (*Artemisia vulgaris* L.) is a deciduous herbaceous perennial weed with deep rhizomes. This species has long been a weed problem for nurseries in parts of the Northeast. However, in the last two decades, mugwort has graduated from a marginal troublesome species to a major invasive weed that is rapidly expanding and colonizing fields and natural areas. One of the major reasons for its expansion is the lack of effective control available for field nursery production. As part of our IPM effort to manage this weed, we urge growers and managers to check for mugwort on incoming plant material and scout for small plants in the field. However, because mugwort can also disperse by seed, it is not possible to rely solely on scouting as a means of preventing movement into new areas. In general, cultivation and rototilling during nursery field production is not advised as a mugwort management technique because the cultivating implements break up rhizomes and spread the weed down the rows. Only a few options are available to manage this

weed with herbicides. In upstate New York, there are three herbicides that have effective activity against this weed: Casoron (dichlobenil), Roundup (glyphosate) and Lontrel (clopyralid). On Long Island, the most effective of these, clopyralid is not available. The question arises whether manipulation of the timing of field cultivation might have a beneficial effect on the performance of the available herbicide tools.

Objectives:

1. Determine if late summer rototilling will improve the ability of currently registered herbicides to control mugwort when they are applied in late fall.
2. Evaluate the effect that late summer rototilling (alone) has on the regenerative ability of this rhizomatous weed.
3. A project evaluation was conducted in the spring 2013 to determine if there is a change in mugwort population due to these treatments.
4. If the hypothesis is correct, then altered recommendations and factsheets will be generated to extend this information to stakeholders in NY.

Procedures:

Established nursery field sites with a significant mugwort infestation in Erie County and Suffolk County. The L.I. site was established, but not treated. The Erie County site was established and treated October 2012.

1. Treatments began in mid August 2012 with rototilling established as the main plot effect.
2. In October 2012, split-plot treatments consisting of LUR applications of Casoron (dichlobenil-granule and spray formulations), glyphosate and clopyralid (upstate only) were applied. Where appropriate, the split plots were then rototilled.

Treatments Applied Mid-October 2012		
<i>TRADE NAME</i>	<i>Form</i>	Rate lb. a.i/A
Untreated	~	~
Rototill	~	~
Casoron	4 G	6 (Incorporated)
Casoron	1.6 ME	2 (Incorporated)
Roundup	5E	2
Lontrel	3E	0.25

4. In March 2013, mugwort emergence will be documented. This data collection will continue through May 2013, at which time the results will be tabulated and analyzed.

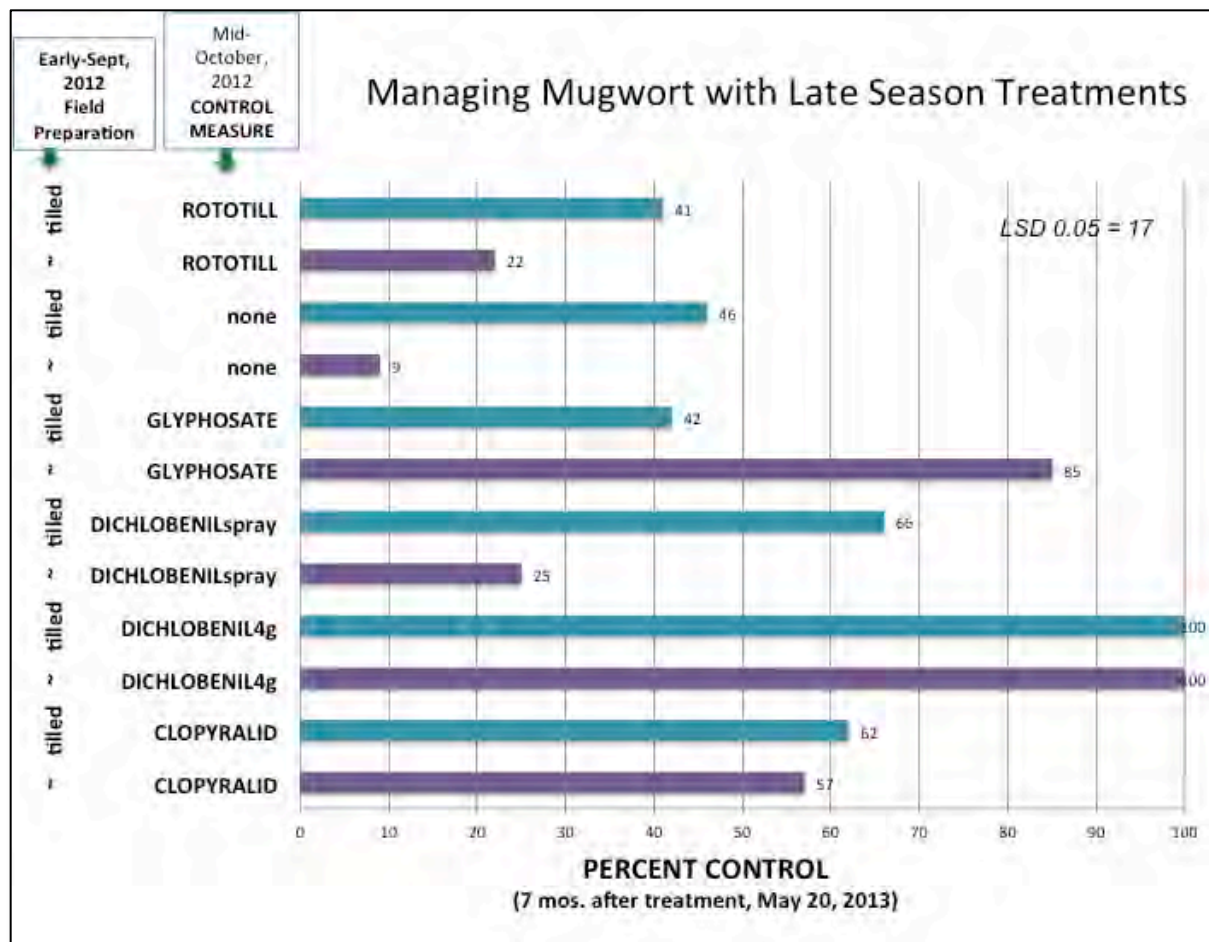
In cooperation with Brian Eshenaur and Elizabeth Lamb, we will distribute the results of this project to NY nursery managers through e-newsletters and other media. Depending on the nature on these results, the information may be incorporated into current Pest Management Guidelines for managing this weed. A factsheet on Mugwort will be written and posted to the NYS IPM website.

8. Results and discussion:

The results of a preliminary stem count are presented in Table 1. The main plot, which was not rototilled in early September had no new mugwort shoot emergence. However, there were significant differences in the emergence from the main plot that was rototilled in September 2012. These results suggest that the most mugwort was emerging from plots that were rototilled in September but not October. The other subplot with significant emergence was treated with glyphosate in October. The other treated plots had little or no mugwort emergence at the time of this preliminary evaluation.

Table 1 Managing Mugwort with Cultivation and Herbicides Investigators: Senesac, Eshenaur Location: Schichtel's Nursery, Smithville, NY Cooperator: Bob Smith				
TREATMENT				
<i>Chemical Name</i>	<i>Application Timing</i>	<i>Form</i>	<i>TRADE NAME</i>	Percent Mugwort Emergence 19-Dec-12
UNTREATED	12-Oct-12	~	~	55 c
DICHLOBENIL	12-Oct-12	4 G	Casoron	0 a
DICHLOBENIL	12-Oct-12	1.6ME	Casoron	2 a
GLYPHOSATE	12-Oct-12	4E	Roundup	29 b
CLOPYRALID	12-Oct-12	3E	Lontrel	1 a
ROTOTILL	12-Oct-12	~	~	2 a
Means separation Fishers Protected LSD 0.05				

Table 2.



The results from the data gathered in Spring 2013 are summarized in Table 2. The data, was collected as a visual estimate of percent mugwort ground cover. The raw data was converted to percent ground cover and analyzed with ANOVA and Fisher's LSD. The results indicate that the glyphosate treatment was more effective on non-tilled plots. It appeared that the tillage operation may have been too late in the season to allow sufficient numbers of rhizomes time to resprout before the glyphosate was applied. The dichlobenil 4G was very effective regardless of tillage. This indicates that the dichlobenil rate can be reduced and excellent control still be obtained. The spray formulation provided some mugwort control. The tilled plots were more susceptible to the spray formulation than the untilled. This indicates that tillage prior to application of a marginally effective treatment like this will help to increase the level of control. Clopyralid was adequate regardless of the tillage regime.

Casoron (Dichlobenil) is an expensive and usually only partially effective tool for managing this weed. If we can improve its effectiveness, then growers will realize an overall reduction in the population of mugwort. Additionally, they should be able to reduce supplemental spot treatments of glyphosate. Outreach about the potential for more effective control of this weed has already included scheduled presentations to commercial growers and nursery managers. Also the information will be disseminated through CCE newsletters and grower IPM e-newsletters.